WHAT IS CLAIMED IS

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      1. A receiving apparatus using a CDMA method for receiving signals by N receiving antennas (N is a positive integer), the signals being transmitted by M transmitting antennas (M is a

10   positive integer), comprising:

      multipath receiving signal demodulating units for primary demodulation of the signals received by the receiving antennas, for estimating the signals transmitted from the transmitting

15   antennas, and for obtaining a received signal of each path of the receiving antennas in a multipath environment based on the estimated signals;

      multipath interference canceling units for deducting the obtained signals received through the

20   paths other than a target path from the signals received by the receiving antennas to obtain multipath interference cancelled signals; and

      a demodulating unit for secondary demodulation of the multipath interference cancelled

25   signals.

30   2. The receiving apparatus as claimed in claim 1, wherein

      the multipath receiving signal demodulating units carry out the primary demodulation using a minimum mean square error

35   (MMSE) method.

3. The receiving apparatus as claimed in claim 1, wherein
   the multipath receiving signal demodulating units carry out the primary demodulation using a maximum likelihood detection (MLD) method.

4. The receiving apparatus as claimed in claim 1, wherein
   the multipath receiving signal demodulating units carry out the primary demodulation using a maximum likelihood detection method using QR factorization on a block of a plurality of the paths.

5. The receiving apparatus as claimed in claim 1, wherein
   the multipath receiving signal demodulating units carry out the primary demodulation using a maximum likelihood detection method using QR factorization on each of the paths.

6. The receiving apparatus as claimed in claim 2, wherein
   the multipath receiving signal demodulating units control an amplitude of the

signal received, based on a probability of correctness of a transmission symbol sequence estimated using the method as claimed in claim 2.

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7. The receiving apparatus as claimed in claim 2, wherein
10   the multipath receiving signal demodulating units estimate a channel coefficient using a known pilot signal transmitted from the M transmitting antennas.

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8. The receiving apparatus as claimed in claim 2, wherein
20   the multipath receiving signal demodulating units and the multipath interference canceling units are arranged in stages.

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9. The receiving apparatus as claimed in claim 8, wherein
        when the multipath receiving signal
30 demodulating units are connected in the stages, each of the stages other than the first stage updates a channel coefficient estimated based on a known pilot signal transmitted from the M transmitting antennas using the multipath interference cancelled signal
35 provided by the multipath interference canceling unit.

10. The receiving apparatus as claimed in claim 1, wherein
        the demodulating unit performs the secondary demodulation using a maximum likelihood detection method.

11. The receiving apparatus as claimed in claim 1, wherein
        the demodulating unit performs the secondary demodulation using a maximum likelihood detection method using QR factorization on a block of a plurality of the paths.

12. The receiving apparatus as claimed in claim 1, wherein
        the demodulating unit performs the secondary demodulation using a maximum likelihood detection method using QR factorization on each of the paths.

13. The receiving apparatus as claimed in claim 1, wherein
        when the signals transmitted from the M transmitting antennas are code-multiplexed signals,
            the multipath receiving signal

demodulating units perform the primary demodulation of the signals received by the corresponding receiving antennas, and obtain the signals of the corresponding paths for all the receiving antennas

5   for all spreading signals,

the multipath interference canceling units deduct the obtained signals corresponding to all the spreading signals received through the paths other than a target path from the signals received by the

10 receiving antennas to obtain multipath interference cancelled signals, and

the demodulating unit performs the secondary demodulation of the multipath interference cancelled signals for each of the spreading signals.

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14. A receiving method of a receiving

20 apparatus for receiving a plurality of signals using a CDMA method, the signals being transmitted from M transmitting antennas (M is a positive integer) and received by N receiving antennas (N is a positive integer), comprising:

25   a step of receiving the signal received by each of the receiving antennas, and estimating the signal transmitted from each of the transmitting antennas using a predetermined algorithm;

a step of multiplying the estimated

30 transmitted signal and a channel coefficient estimated based on a known pilot signal, and obtaining the received signal of each path for each of the receiving antennas in a multipath environment;

35   a step of deducting the obtained received signals of the paths other than a target path from the signal received by each of the receiving

antennas; and

a step of demodulating the signals that are obtained by the step of deducting.

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15. A radio communications system, comprising:

10   the receiving apparatus as claimed in claim 1; and

a transmitting apparatus including the M transmitting antennas (M is a positive integer) for transmitting a CDMA signal from each of the

15 transmitting antennas.